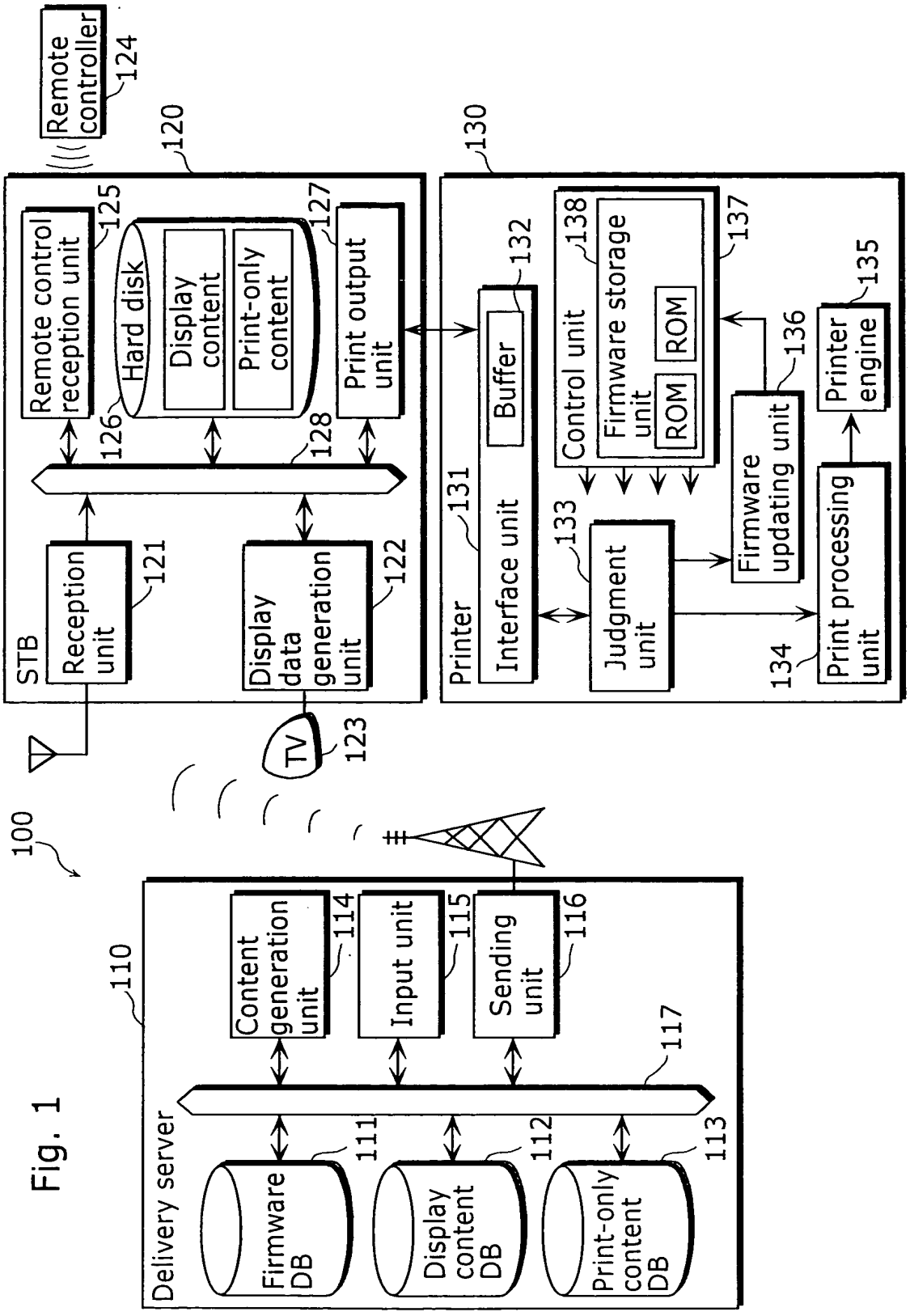
100
Delivery server
110
Firmware DB
111
Display content DB
112
Print-only content DB
113
Content generation unit
114
Input unit
115
Sending unit
116
117
TV
123
STB
Reception unit
121
Display data generation unit
122
Remote control reception unit
125
Hard disk
126
Display content
Print-only content
127
128
Print output unit
Remote controller
124
120
Printer
Interface unit
131
Buffer
132
Judgment unit
133
Print processing unit
134
Firmware updating unit
136
Control unit
138
Firmware storage unit
ROM
ROM
137
Printer engine
135
130

Fig. 1

Fig. 2

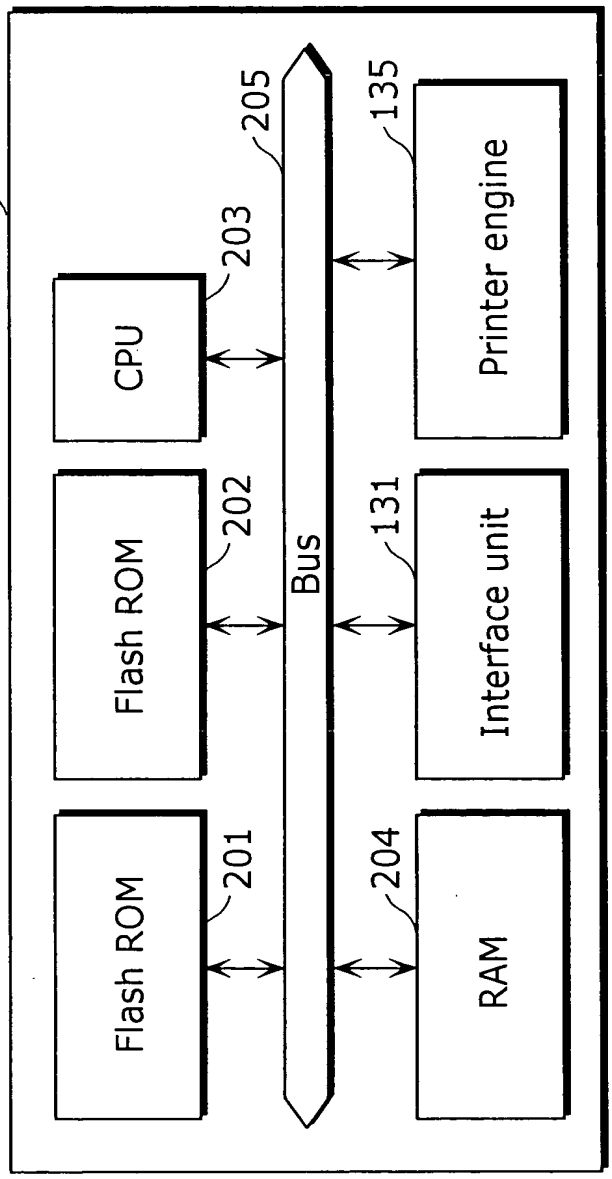
130
Flash ROM
201
Flash ROM
202
CPU
203
RAM
204
Bus
205
Interface unit
131
Printer engine
135

Fig. 3A

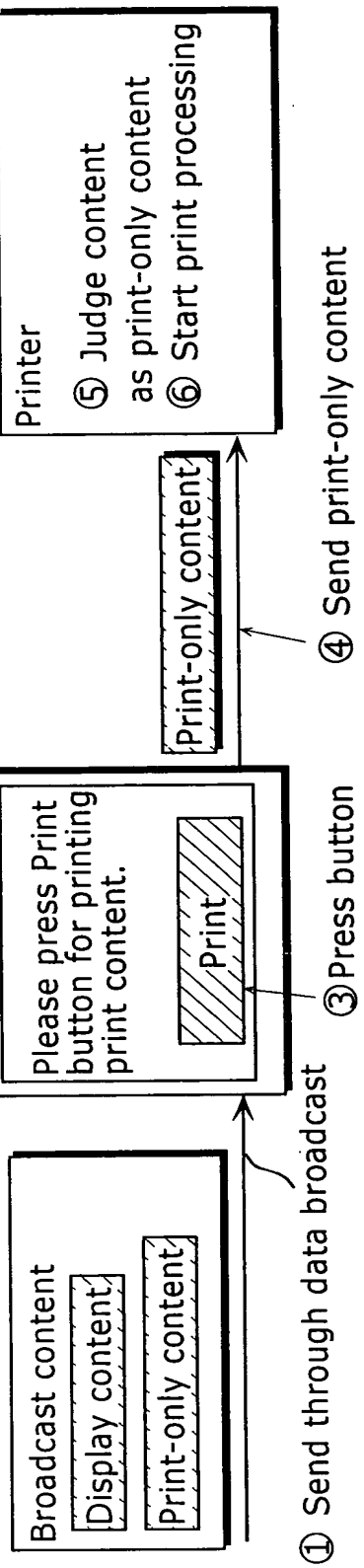
Broadcast content
Display content
Print-only content
① Send through data broadcast
120
STB
Please press Print button for printing print content.
Print
③ Press button
② Screen display of display content
Print-only content
④ Send print-only content
130
Printer
⑤ Judge content as print-only content
⑥ Start print processing

Fig. 3B

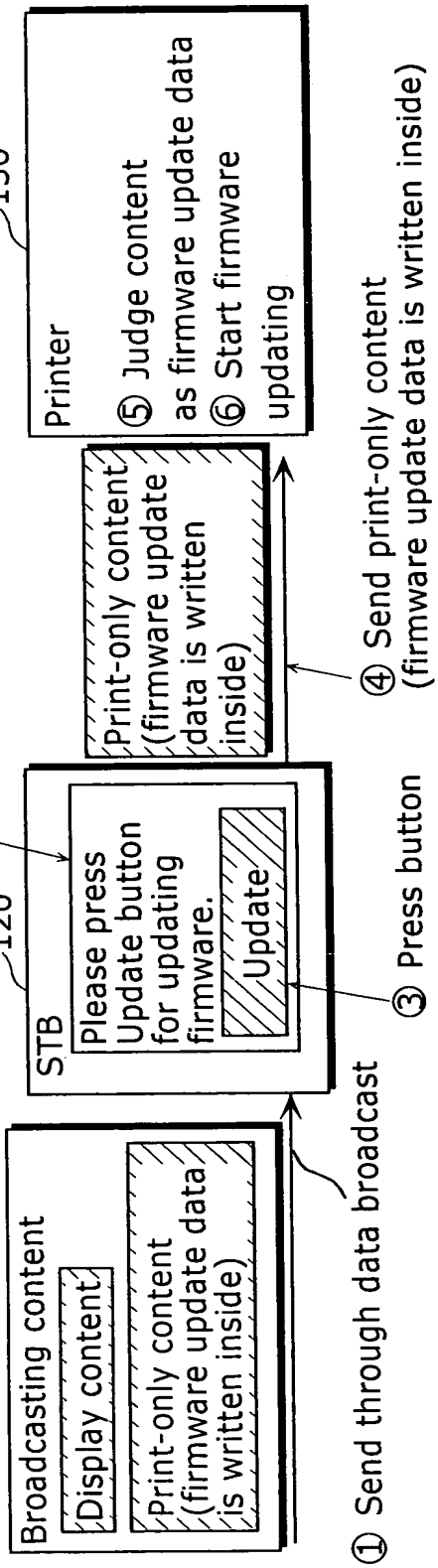
Broadcasting content
Display content
Print-only content (firmware update data is written inside)
① Send through data broadcast
120
STB
Please press Update button for updating firmware.
Update
③ Press button
② Screen display of display content
Print-only content (firmware update data is written inside)
④ Send print-only content (firmware update data is written inside)
130
Printer
⑤ Judge content as firmware update data
⑥ Start firmware updating

Fig. 4A

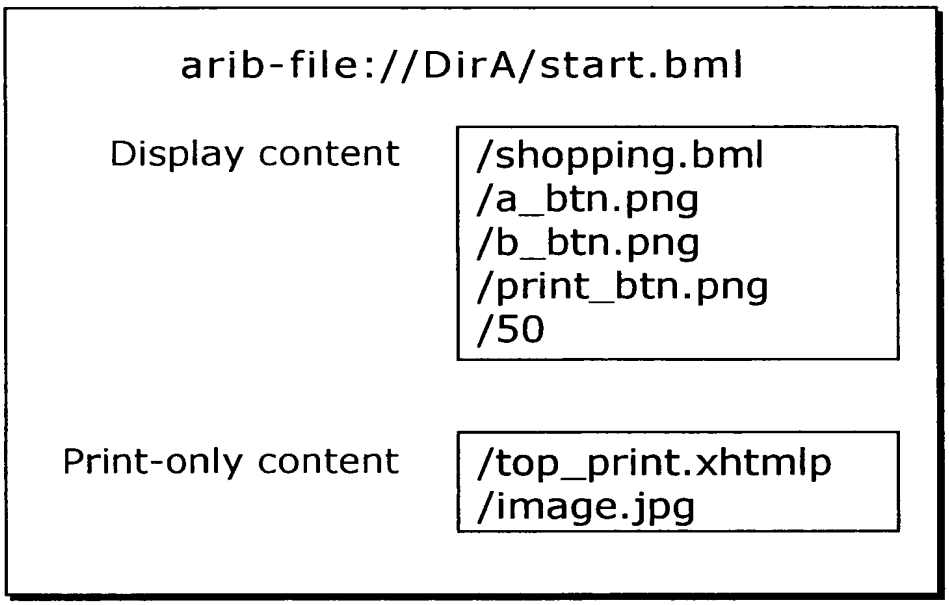
arib-file://DirA/start.bml
Display content
/shopping.bml
/a_btn.png
/b_btn.png
/print_btn.png
/50
Print-only content
/top_print.xhtmlp
/image.jpg

Fig. 4B

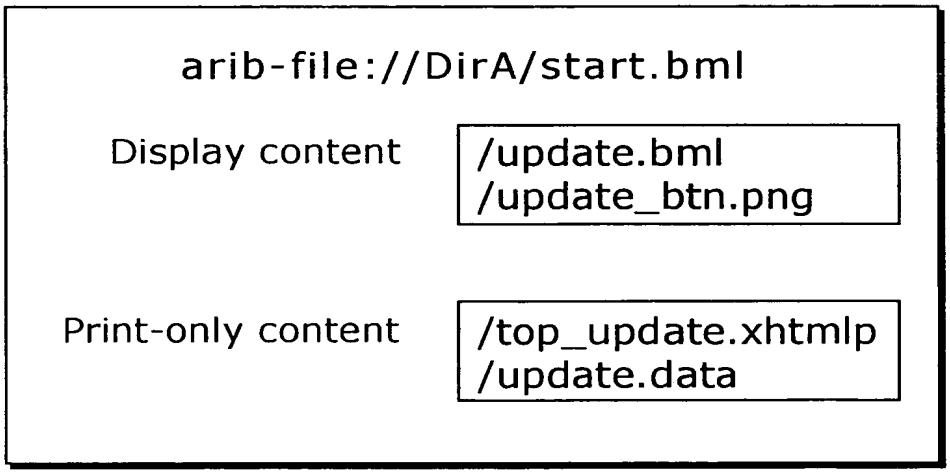
arib-file://DirA/start.bml
Display content
/update.bml
/update_btn.png
Print-only content
/top_update.xhtmlp
/update.data

Fig. 5A

Display "Shopping.bml"

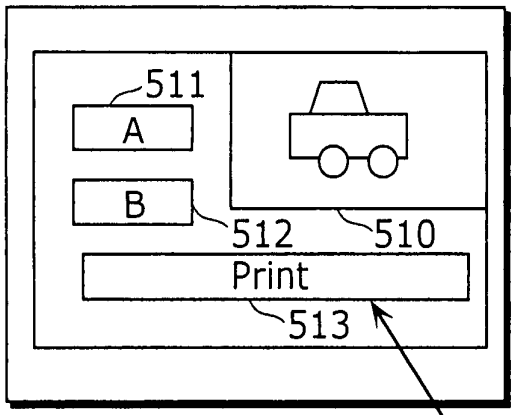

Fig. 5B

```
<?xml version="1.0" encoding="Shift_JIS" ?>                                  } L501
<!DOCTYPE bml PUBLIC "+//ARIB STD-B24:1999//DTD BML
 Document//JA" "bml_1_0.dtd">
<?bml bml-version="1.0" ?>
<bml>                                                                        } L502
  <head>
    <title>shopping</title>
  <script>                                                                   } L503
<![CDATA[
    function keydown() {
     browser.print("./top_print.xhtmlp");
    }
]]>
  </script>
 </head>
  <body>
    <object id="video" type="video/X-arib-mpeg2" data="/50"                  } L504
     style="left:528px; top:40px; width:360px; height:202px" />
   <object type="image/X-arib-png" id="A" data="a_btn.png"                   } L505
    style="left:68px; top:150px; width:176px; height:48px;"/>
   <object type="image/X-arib-png" id="B" data="b_btn.png"                   } L506
   style="left:68px; top:300px; width:176px; height:48px;"/>
   <object type="image/X-arib-png" id="print" data="print_btn.png"           } L507
   style="left:80px; top:456px; width:720px; height:48px;"
   onkeydown="keydown();"/>
  </body>
</bml>
```

Fig. 6

```
<?xml version="1.0"?>
 <!DOCTYPE html PUBLIC "-//PWG//DTD XHTML-Print 1.0//EN"
 "http://www.pwg.org/xhtml-print/xhtml-print10.dtd">
 <html xmlns="http://www.w3.org/1999/xhtml">
 <head>
    <title> TV Shopping </title>
</head>
  <body>
    <p>
    TV shopping through data broadcast
              :
      (Omission)                                                    } L601
              :
    End of printing
    </p>
    <!? image__>
         <object type="image/jpeg" data="image.jpeg"
         style="left:528px; top:40px; width:360px; height:202px"/> } L602
  </body>
</html>
```

Fig. 7A

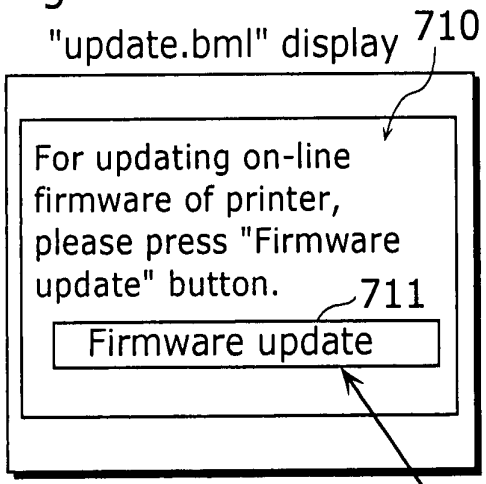

Fig. 7B

```
<?xml version="1.0" encoding="Shift_JIS" ?>
<!DOCTYPE bml PUBLIC "+//ARIB STD-B24:1999//DTD BML
 Document//JA" "bml_1_0.dtd">
<?bml bml-version="1.0" ?>
<bml>
  <head>
    <title>update</title>
   <script>
<![CDATA[
    function keydown() {                          } L701
      browser.print("./top_update.xhtmlp");
    }
]]>
   </script>
  </head>
  <body>
    <p>
        For updating on-line firmware of printer,
        please press "Firmware update" button.    } L702
    </p>
   <object type="image/X-arib-png" id="print" data="update_btn.png"
   style="left:68px; top:456px; width:176px; height:48px;"
   onkeydown="keydown();"/>                                  L703
  </body>
</bml>
```


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Fig. 8

```
<?xml version="1.0"?>
 <!DOCTYPE html PUBLIC "-//PWG//DTD XHTML-Print 1.0//EN"
 "http://www.pwg.org/xhtml-print/xhtml-print10.dtd">
 <html xmlns="http://www.w3.org/1999/xhtml">
 <head>
   <title> Update </title>
</style>
 </head>
 <body>
   <update  printer_vendor="MEI" soft_version="5.0.1"
    machine_type="cefiro2002" option_unit=""          L801
src="update.data"/>  L802
   <p>version of firmware is updated.
  present version is "5.0.1"</p>                      } L803
  </update>
  </body>
</html>
```


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Fig. 9

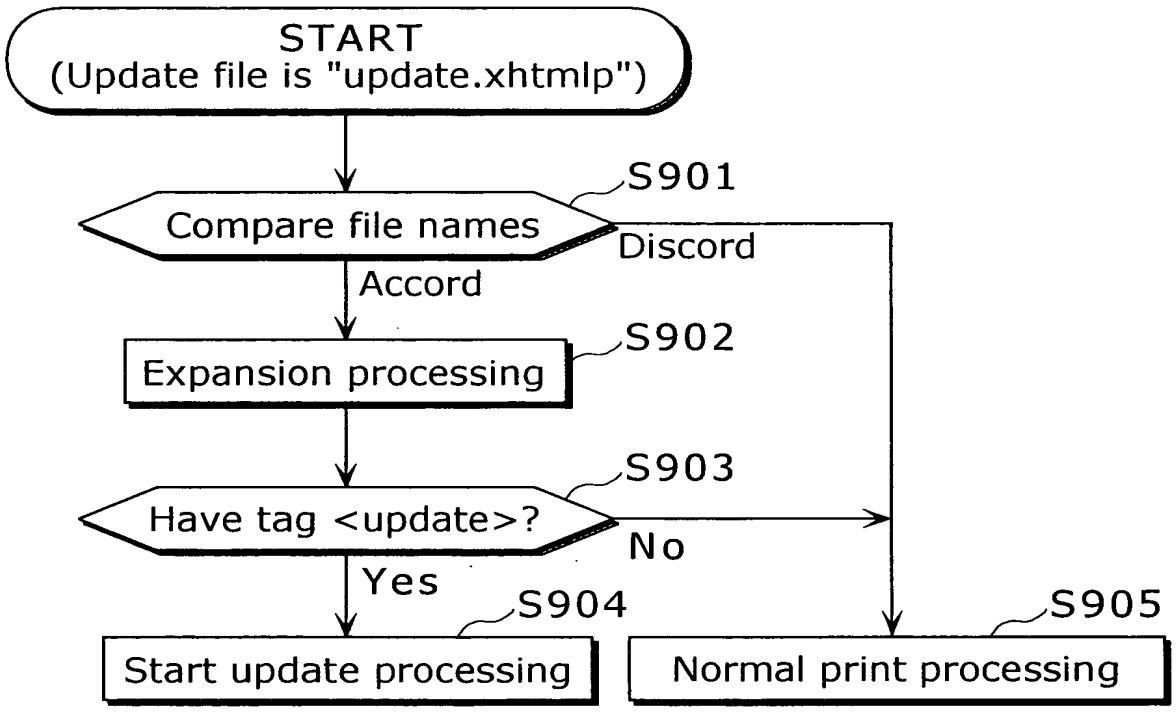
START
(Update file is "update.xhtmlp")
S901
Compare file names
Discord
Accord
S902
Expansion processing
S903
Have tag <update>?
No
Yes
S904
Start update processing
S905
Normal print processing

Fig. 10

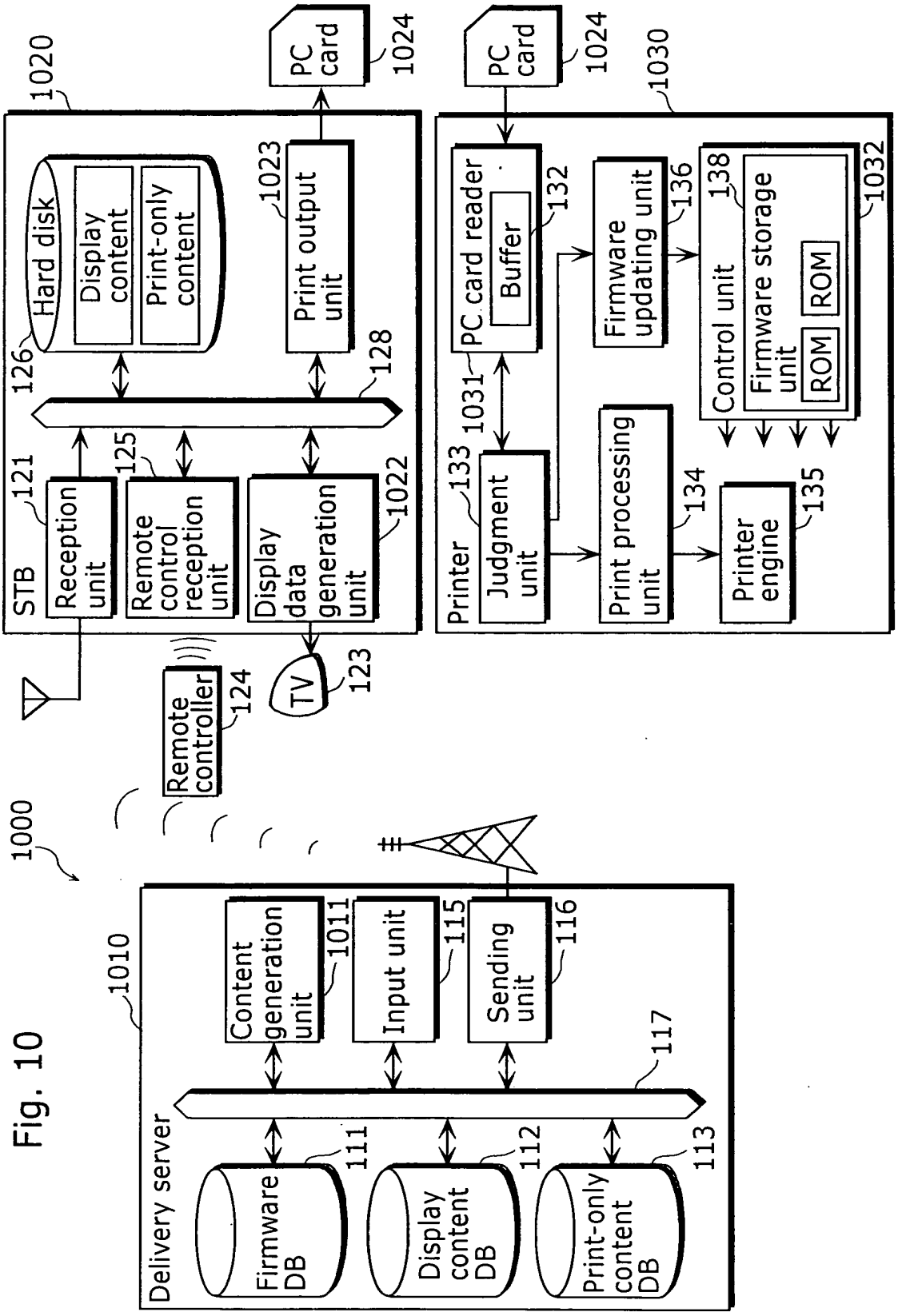
1000
Delivery server
1010
Content generation unit
1011
Input unit
115
Sending unit
116
117
Firmware DB
111
Display content DB
112
Print-only content DB
113
Remote controller
124
TV
123
STB
1020
Reception unit
121
Remote control reception unit
125
Display data generation unit
1022
Hard disk
126
Display content
Print-only content
Print output unit
1023
128
PC card
1024
Printer
1030
Judgment unit
133
1031
PC card reader
Buffer
132
Print processing unit
134
Printer engine
135
Firmware updating unit
136
Control unit
138
Firmware storage unit
ROM
ROM
1032

Fig. 11A

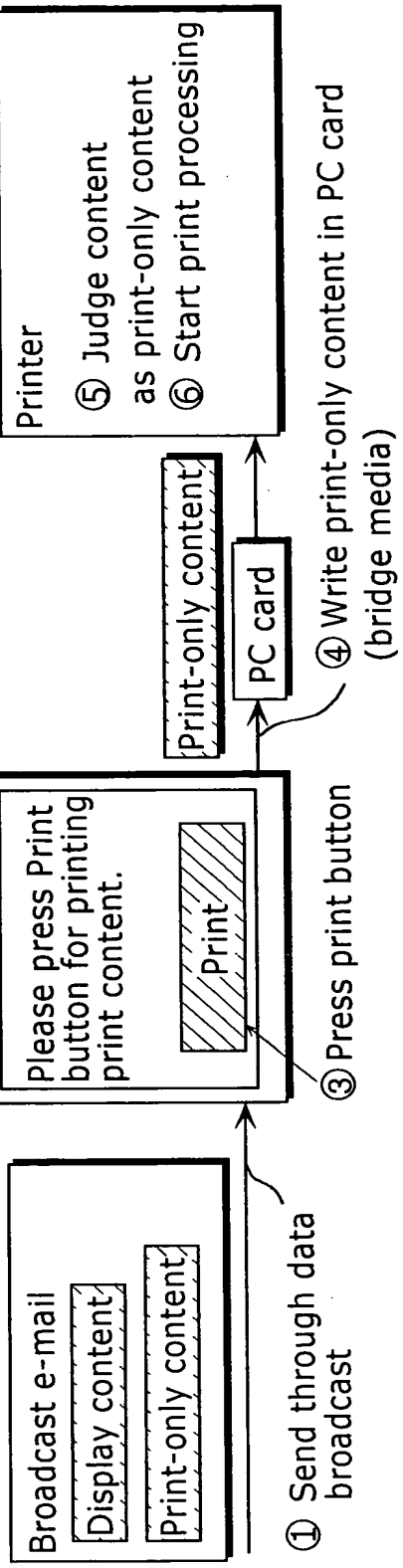

Fig. 11B

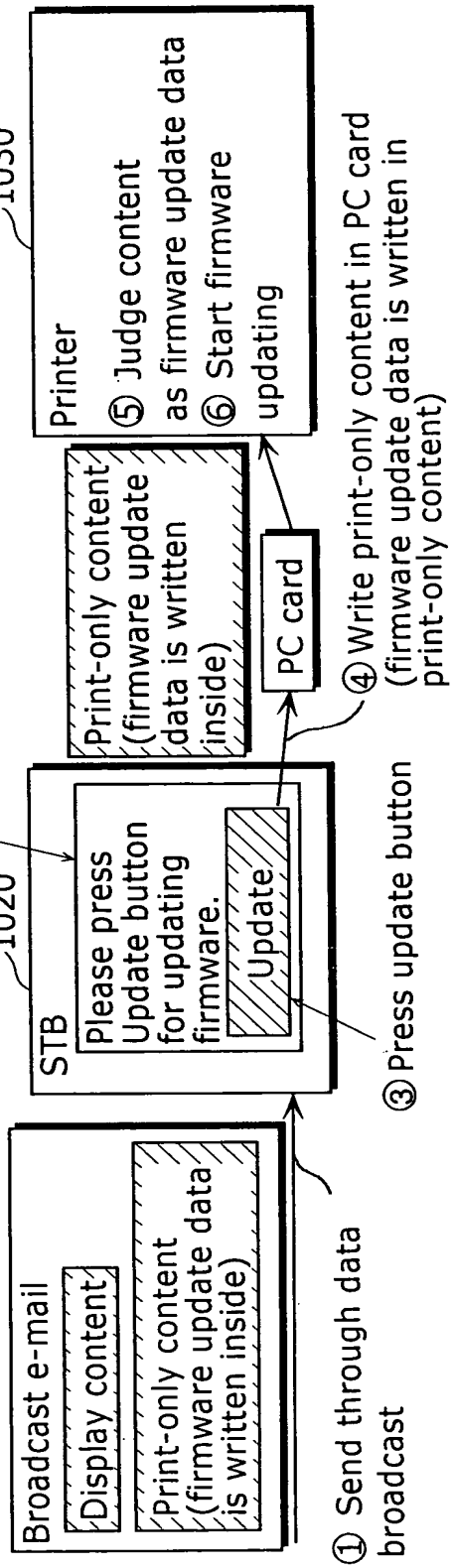

Fig. 12A

Display "Shopping.bml"

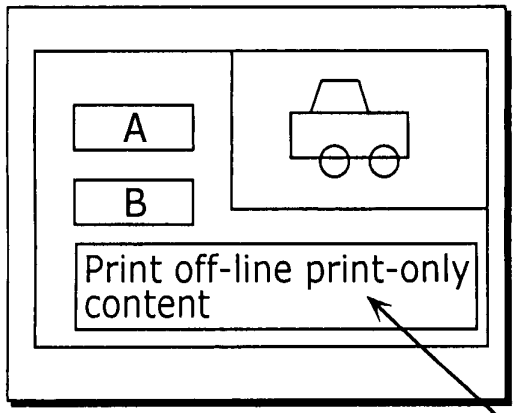

Fig. 12B

```
<?xml version="1.0" encoding="Shift_JIS" ?>
<!DOCTYPE bml PUBLIC "+//ARIB STD-B24:1999//DTD BML
 Document//JA" "bml_1_0.dtd">
<?bml bml-version="1.0" ?>
<bml>
  <head>
    <title>shopping</title>
   <script>
<![CDATA[
     function keydown() {
      browser.save("./top_print.xhtmlp",   "SD");
      browser.save("./image.jpg",   "SD");
     }
]]>
   </script>
  </head>
  <body>
    <object id="video" type="video/X-arib-mpeg2" data="/50"
     style="left:528px; top:40px; width:360px; height:202px" />
    <object type="image/X-arib-png" id="A" data="a_btn.png"
    style="left:68px; top:456px; width:176px; height:48px;"/>
    <object type="image/X-arib-png" id="B" data="b_btn.png"
    style="left:68px; top:456px; width:176px; height:48px;"/>
    <object type="image/X-arib-png" id="print" data="print_btn.png"
    style="left:68px; top:456px; width:176px; height:48px;"
    onkeydown="keydown();"/>
  </body>
</bml>
```

L1201

L1202

Fig. 13A

Display "update.bml"

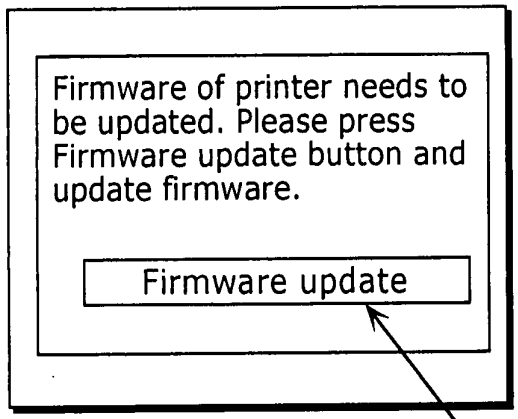

Fig. 13B

```
<?xml version="1.0" encoding="Shift_JIS" ?>
<!DOCTYPE bml PUBLIC "+//ARIB STD-B24:1999//DTD BML
 Document//JA" "bml_1_0.dtd">
<?bml bml-version="1.0" ?>
<bml>
  <head>
    <title>update</title>
   <script>
<![CDATA[
     function keydown() {
       browser.save("./top_update.xhtmlp",   "SD");
       browser.save("./update.data",   "SD");
     }
]]>
   </script>
  </head>
  <body>
    <p>
         Firmware of printer needs to be updated.
         Please press Firmware update button and update firmware.
    </p>
   <object type="image/X-arib-png" id="print" data="update_btn.png"
   style="left:68px; top:456px; width:176px; height:48px;"
   onkeydown="keydown();"/>
</body>
</bml>
```

L1301

L1302

L1303

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Fig. 14

```
<?xml version="1.0"?>
 <!DOCTYPE html PUBLIC "-//PWG//DTD XHTML-Print 1.0//EN"
 "http://www.pwg.org/xhtml-print/xhtml-print10.dtd">
 <html xmlns="http://www.w3.org/1999/xhtml">
 <head>
    <title> Test Pages </title>
</style>
 </head>
 <body>
    <update  printer_vendor="MEI" version="5.0.1">
       src="http://www.virtual.co.jp /firm.data"/>
</update>                                    L1401
 </body>
</html>
```

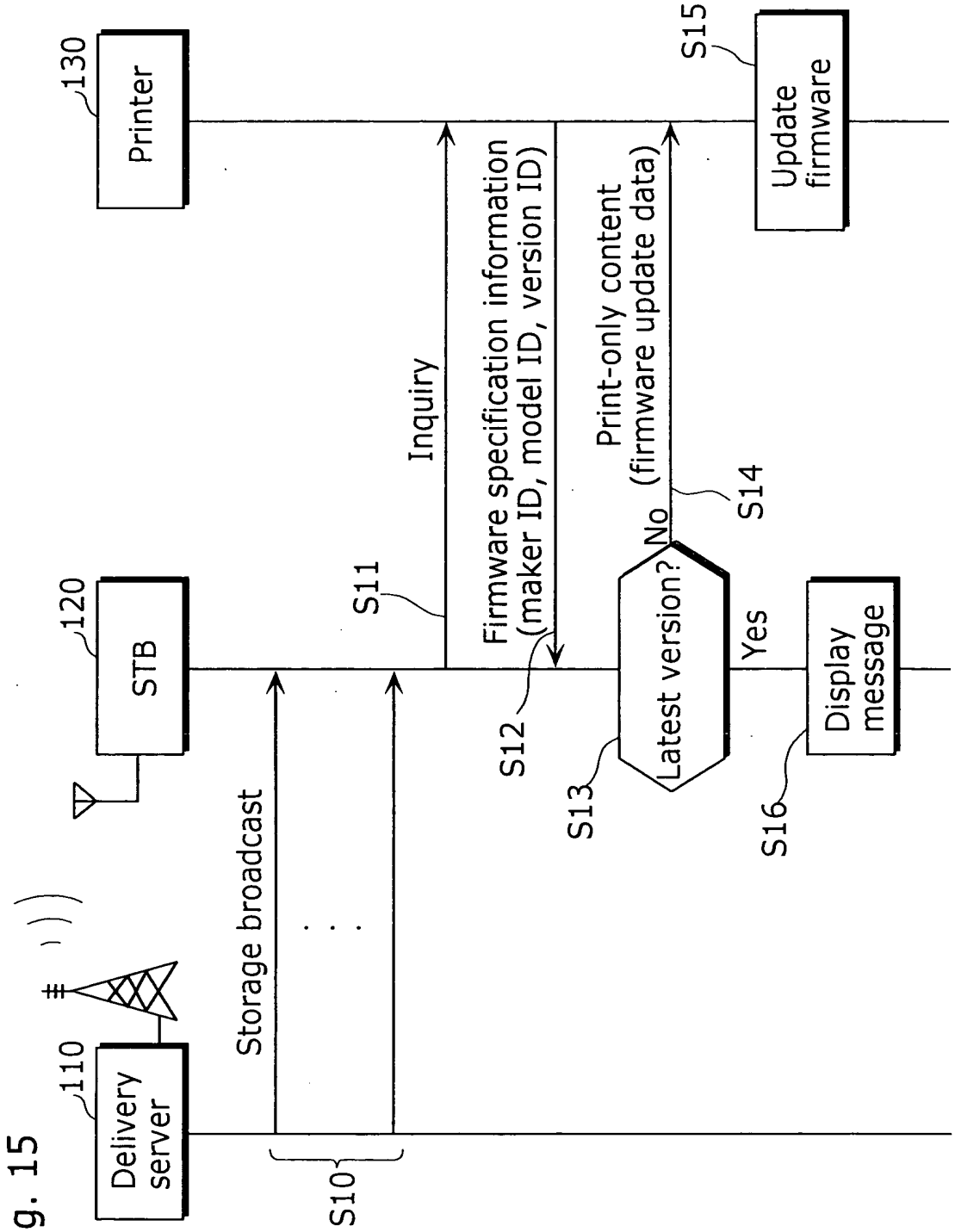
110
Delivery server
120
STB
130
Printer
Storage broadcast
S10
S11
Inquiry
Firmware specification information (maker ID, model ID, version ID)
S12
S13
Latest version?
No
Yes
S14
Print-only content (firmware update data)
S15
Update firmware
S16
Display message

Fig. 15

Fig. 16

```
<?xml version="1.0" encoding="Shift_JIS" ?>
<!DOCTYPE bml PUBLIC "+//ARIB STD-B24:1999//DTD BML
 Document//JA" "bml_1_0.dtd">
<?bml bml-version="1.0" ?>
<bml>
  <head>
    <title>update</title>
   <script>
<![CDATA[
     function keydown() {
       //in the case of only two makers
      if{browser.getPrinterMaker ID()==10} //in the case where maker ID is 10
     {
         if{browser.getPrinterTypeID()==1) //in the case where model ID is 1
         {
           if{browser.getPrinterSoftwareVersion()<2) //in the case where version ID is no
more than 2
          {
            browser. print "./top_update_maker10_type1_v2.xhtmlp "):://print
(actually update version)
           }
           else//in the case where model ID is 2
            {
             //make visible button "This is latest version.  No need to
update firmware".
             //processing details omitted
            }
       }
       else 1*(browser. getPrinterTypeID()==2) //in the case where model ID is 2
       {
         //only ".top_update_maker10_type1_v2.xhtmlp" changes as
in the case where model ID is 1
       }
       else  //in the case where model ID is neither 1 nor 2
       {
          // make visible button "No version-upgrade data corresponding to
model is found".
          //processing details omitted
        }
     }
     else if (browser getPrinterMakerID()==20)  //in the case where maker ID is 20
     {
          //omitted as in the case where maker ID is 10
      }
      else//in the case where maker ID is neither 10 nor 20
      {
          // make visible button "No version-upgrade data corresponding to
maker is found".
      }
    }
]]>
   </script>
  </head>
   <body>
       <p>
            For updating on-line firmware of printer,  please press
            "Firmware update" button.
       </p>
        <object type="image/X-arib-png" id="print" data="print_btn.png"
   style="left:68px; top:456px; width:176px; height:48px;"
   onkeydown="keydown();"/>
   </body>
 </bml>
```

Fig. 17

Examples of API:

int browser. getPrinterMakerID():
Return value: -1 (error)
No fewer than 0 is maker ID

---

int browser. getPrinterTypeID():
Return value: -1 (error)
No fewer than 0 is model ID (maker uniquely assigns)

---

int browser. getPrinterSoftwareVersion():
Return value: -1 (error)
No fewer than 0 is version ID (maker uniquely assigns)

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Fig. 18

Examples of API:

int browser. getCapablePrinterNumber():
Return value: -1: error
0: success
N: number of printers connected

---

int browser. getCapablePrinterList(int List[]):
Argument: printer list: (variable length sequence:
update value)
Return value: -1: error
0: success

---

int browser. getPrinterMakerID(int printerID):
Argument: printer ID (printer ID obtained from "browser.
getCapablePrinterList")
Return value: -1: (error)
No fewer than 0 is maker ID

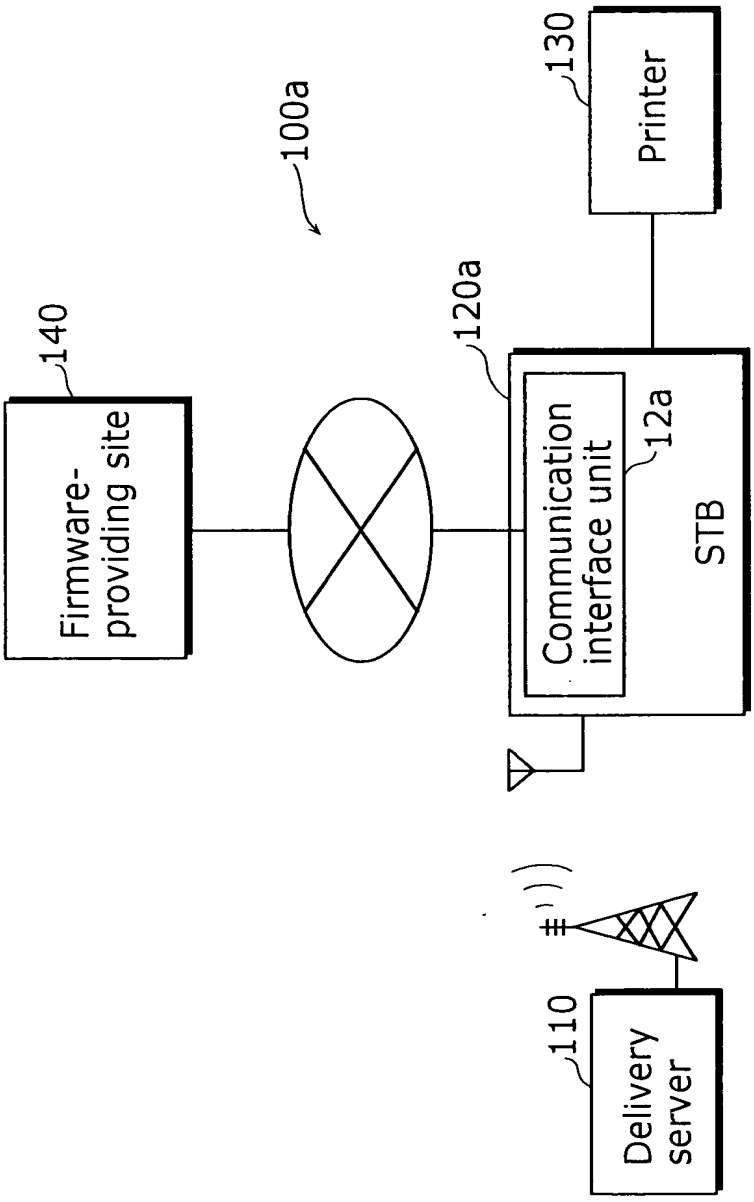
---

int browser. getPrinterTypeID():
Argument: printer ID (printer ID obtained from "browser.
getCapablePrinterList")
Return value: -1: (error)
No fewer than 0 is model ID
(maker uniquely assigns)

---

int browser. getPrinterSoftwareVersion():
Argument: printer ID (printer ID obtained from "browser.
getCapablePrinterList")
Return value: -1: (error)
No fewer than 0 is version ID
(maker uniquely assigns)

Fig. 19


100a
130
Printer
120a
140
Firmware-providing site
Communication interface unit
12a
STB
110
Delivery server

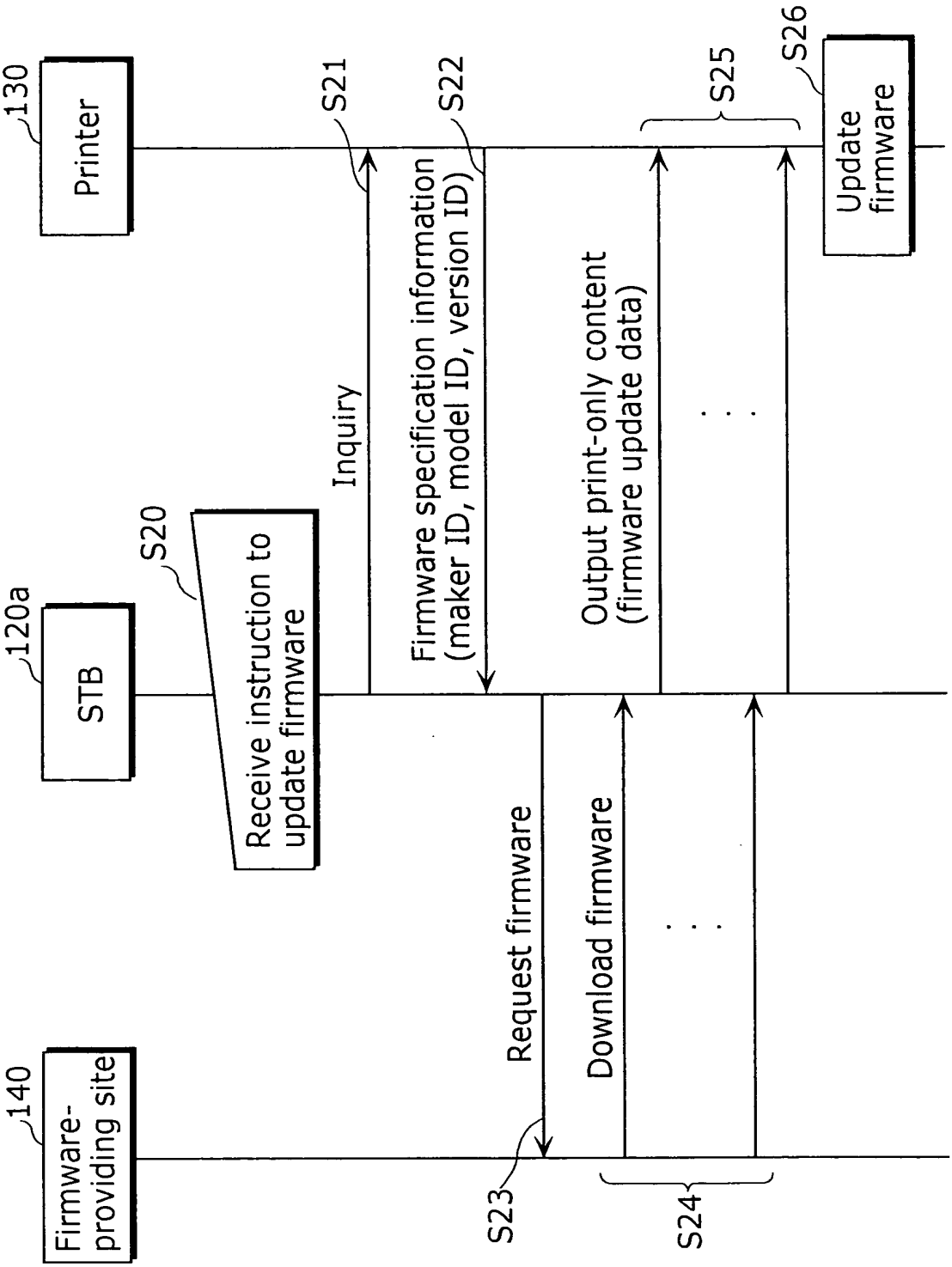

130
Printer
120a
STB
140
Firmware-providing site
S20
Receive instruction to update firmware
S21
Inquiry
S22
Firmware specification information (maker ID, model ID, version ID)
S23
Request firmware
S24
Download firmware
S25
Output print-only content (firmware update data)
S26
Update firmware

Fig. 20

Fig. 21

```
<?xml version="1.0" encoding="Shift_JIS" ?>
<!DOCTYPE bml PUBLIC "+//ARIB STD-B24:1999//DTD BML
 Document//JA" "bml_1_0.dtd">
<?bml bml-version="1.0" ?>
<bml>
  <head>
    <title>update</title>
   <script>
<![CDATA[
     function keydown() {
       //in the case of only two makers
      if{browser.getPrinterMaker ID()==10} //in the case where maker ID is 10
     {
         if{browser.getPrinterTypeID()==1) //in the case where model ID is 1
         {
           if{browser.getPrinterSoftwareVersion()<2) //in the case where version ID is
no more than 2
          {
browser. print ("http://makerID/type1/v2/top_update_maker10_type1_v2.
xhtmlp "):
                    //download from Internet and print (actually
update version) }
                  }
                  //omission
               }
               //omission
             }
             //omission
           }
]]>
   </script>
  </head>
   <body>
            //omission
  </body>
</bml>
```

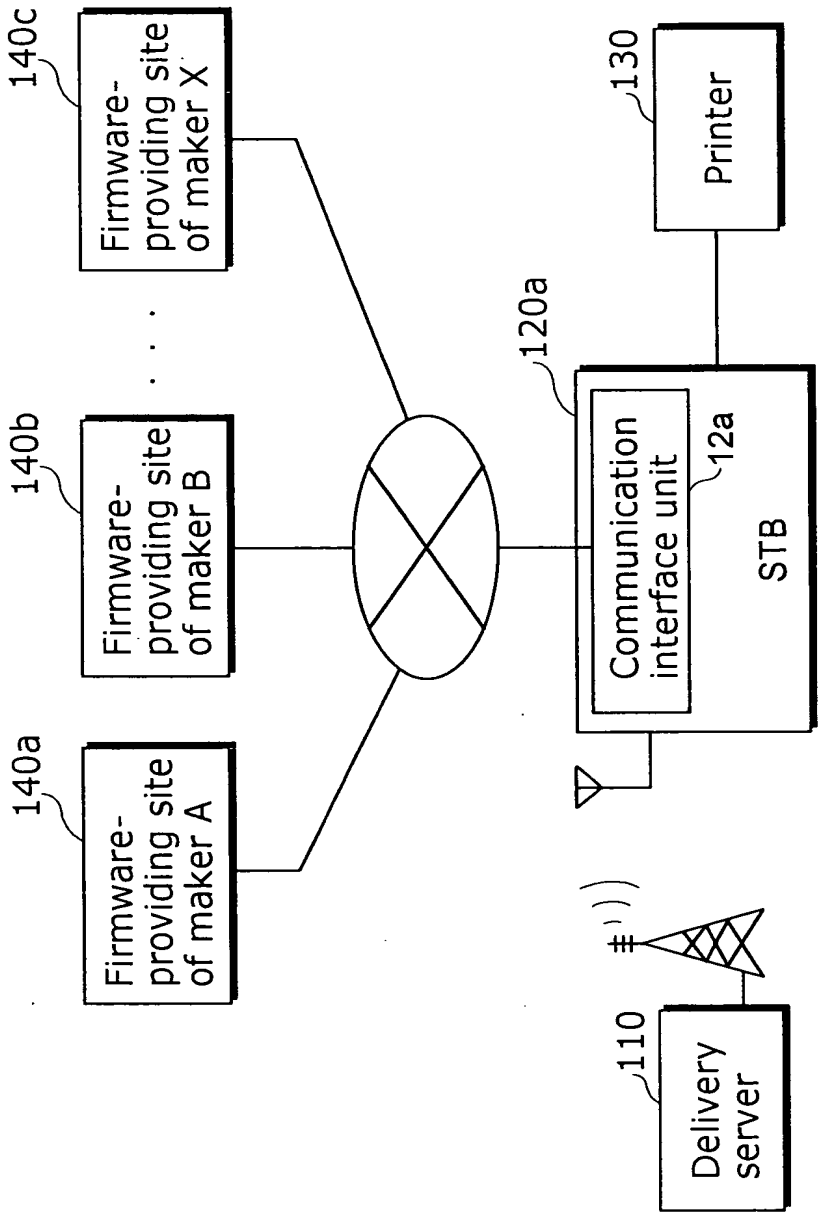

140c
Firmware-providing site of maker X
140b
Firmware-providing site of maker B
140a
Firmware-providing site of maker A
130
Printer
120a
Communication interface unit
12a
STB
110
Delivery server

Fig. 22

Fig. 23

```
<?xml version="1.0" encoding="Shift_JIS" ?>
<!DOCTYPE bml PUBLIC "+//ARIB STD-B24:1999//DTD BML
 Document//JA" "bml_1_0.dtd">
<?bml bml-version="1.0" ?>
<bml>
  <head>
    <title>update</title>
   <script>
<![CDATA[
    function keydown() {
      //in the case of only two makers
     if{browser.getPrinterMaker ID()==10} //in the case where maker ID is 10
    {
        if{browser.getPrinterTypeID()==1) //in the case where model ID is 1
        {
          if{browser.getPrinterSoftwareVersion()<2) //in the case where version ID is
no more than 2
          {
browser. print ("http://maker10/type1/v2/top_update_maker10_type1_v2.
xhtmlp "):
    /top_update_maker10_type1_v2. xhtmlp ")
                  browser_print("top_update_maker10_type1_v2. xhtmlp "):
                 //download from Internet and print (actually update
version) }
                }
                //omission
              }
              //omission
            }
            //omission
          }
]]>
   </script>
  </head>
  <body>
          //omission
  </body>
</bml>
```

Fig. 24

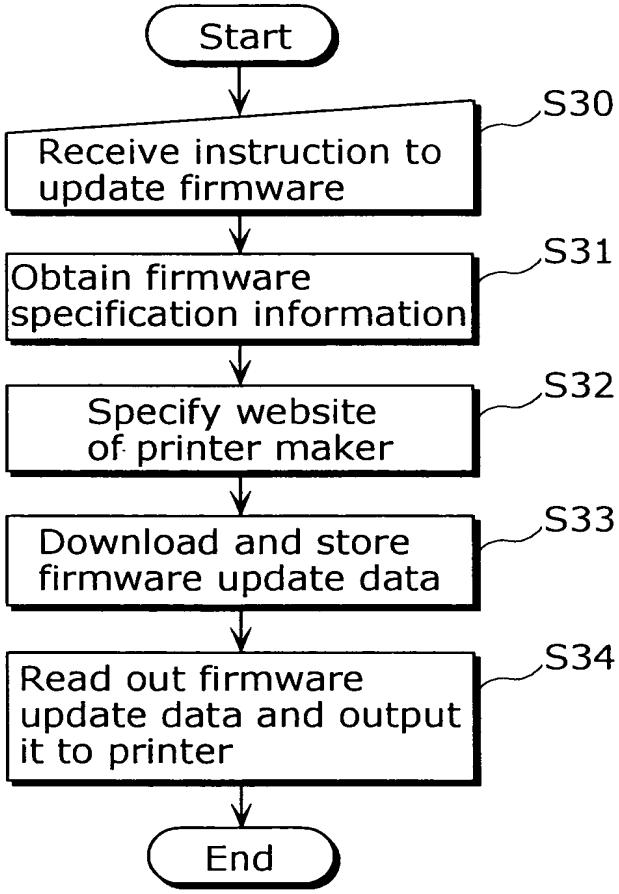

Start
Receive instruction to update firmware
S30
Obtain firmware specification information
S31
Specify website of printer maker
S32
Download and store firmware update data
S33
Read out firmware update data and output it to printer
S34
End

Fig. 25

```
<?xml version="1.0"?>
 <!DOCTYPE html PUBLIC "-//PWG//DTD XHTML-Print 1.0//EN"
 "http://www.pwg.org/xhtml-print/xhtml-print10.dtd">
 <html xmlns="http://www.w3.org/1999/xhtml">
 <head>
   <title> Update </title>
</style>
 </head>
 <body>
   <update  printer_vendor="MEI" soft_version="5.0.1"
    machine_type="cefiro2002" option_unit="" >          L801
src="update.dll"/>          L802
   <p>version of firmware is updated.
  present version is 5.0.1.</p>          L803
  </update>
  </body>
</html>
```

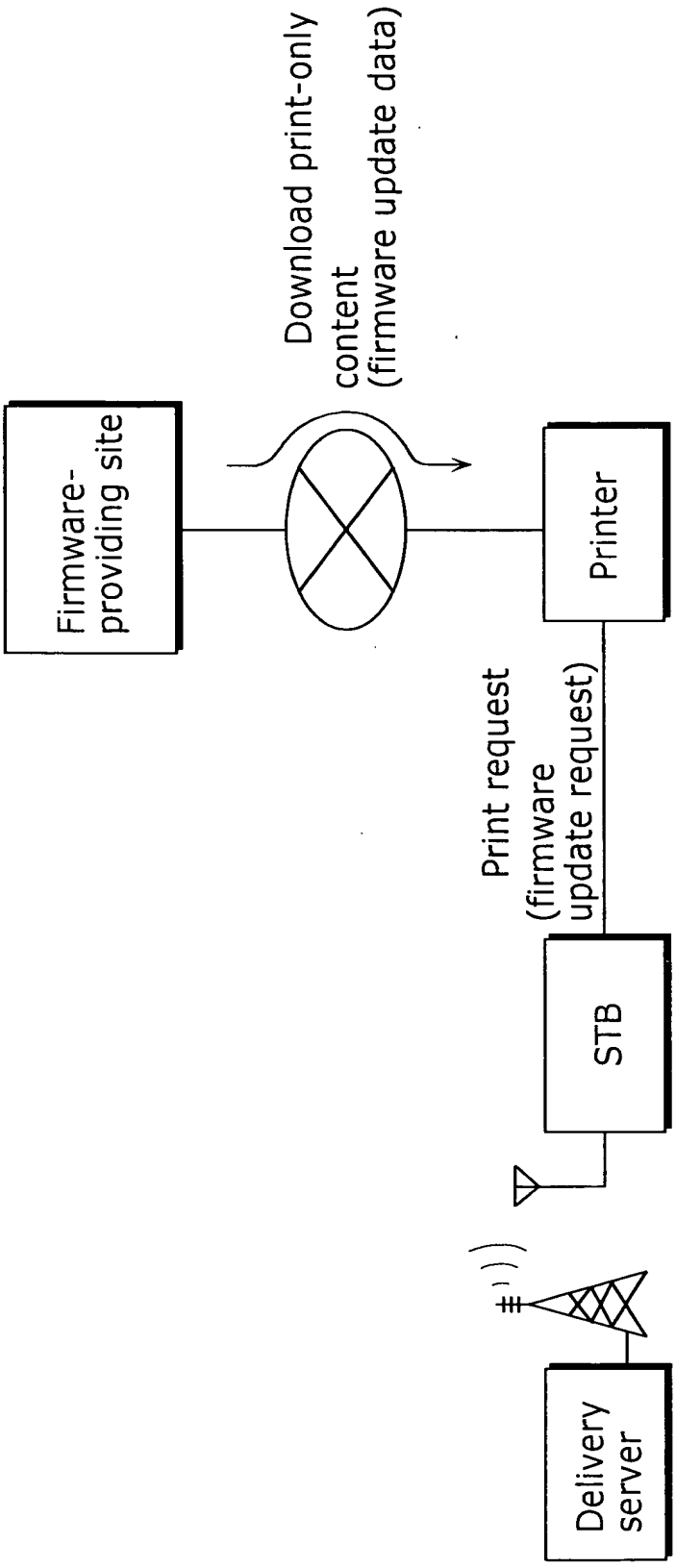

Firmware-providing site
Download print-only content (firmware update data)
Printer
Print request (firmware update request)
STB
Delivery server

Fig. 26